

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant: Takehiko Yamakawa; Toshio Ishizaki; Toru Yamada; Shoichi Kitazawa; Tomoyuki Iwasaki : Art Unit:
Serial No.: To be assigned : Examiner:
Filed: Herewith :
FOR: MULTILAYER ELECTRONIC :
COMPONENT AND COMMUNICATION :
APPARATUS :

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, D.C. 20231

SIR:

Prior to examination, please amend the above-identified application as follows:

IN THE TITLE:

Please delete the title in its entirety and substitute therefor --MULTILAYER ELECTRONIC COMPONENT AND COMMUNICATION APPARATUS AND METHOD--.

Please replace the paragraph beginning at page 1, line 5 with the following:

The present invention relates to a multilayer electronic component used in a mobile communication apparatus such as a portable telephone.

Please replace the paragraph beginning at page 2, line 19 with the following:

An object of the present invention is, considering the above problem, to obtain the multilayer electronic component, and its method of manufacture capable of providing an inductor having a high impedance in the multilayered

product without using an exterior inductor and providing a plurality of inductors that are close and have little influence over one another.

Please replace the paragraph beginning at page 3, line 1 with the following:

One aspect of the present invention is a multilayer electronic component having a multilayered product laminating a plurality of dielectric sheets as one piece,

a plurality of grounded electrodes provided among said dielectric sheets being different inside said multilayered product, and

inductor electrodes provided on said dielectric sheet surfaces not having said plurality of grounded electrodes inside said multilayered product,

wherein all or part of said inductor electrodes are placed in position so as not to be sandwiched by said plurality of grounded electrodes.

Please replace the paragraph beginning at page 3, line 13 with the following:

Another aspect of the present invention is the multilayer electronic component, wherein the part of said inductor electrodes not sandwiched by said plurality of grounded electrodes is one portion of one inductor electrode.

Please replace the paragraph beginning at page 3, line 18 with the following:

Still another aspect of the present invention is the multilayer electronic component, wherein the part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are one piece or a plurality of pieces of a plurality of the inductor electrodes.

Please replace the paragraph beginning at page 3, line 23 with the following:

Yet still another aspect of the present invention is the multilayer electronic component, wherein all or part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are placed on the dielectric sheets not sandwiched by said plurality of grounded electrodes.

Please replace the paragraph beginning at page 4, line 4 with the following:

Still yet another aspect of the present invention is the multilayer electronic component, wherein all or part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are placed on the dielectric sheets sandwiched by said plurality of grounded electrodes.

Please replace the paragraph beginning at page 4, line 10 with the following:

A further aspect of the present invention is the multilayer electronic component, wherein part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are formed by having slots formed on said grounded electrodes overlap said inductor electrodes.

Please replace the paragraph beginning at page 4, line 16 with the following:

A still further aspect of the present invention is the multilayer electronic component, wherein all of said inductor electrodes not sandwiched by said plurality of grounded electrodes are formed by having slots having substantially the same shape as said inductor electrodes formed on said grounded electrodes overlap said inductor electrodes.

Please replace the paragraph beginning at page 4, line 23 with the following:

A yet further aspect of the present invention is the multilayer electronic component, wherein part and other remaining portions of said inductor electrodes not sandwiched by said plurality of grounded electrodes are placed on said dielectric sheets that are the same.

Please replace the paragraph beginning at page 5, line 4 with the following:

A still yet further aspect of the present invention is a multilayer electronic component having a multilayered product laminating a plurality of dielectric sheets as one piece,

Please replace the paragraph beginning at page 5, line 15 with the following:

An additional aspect of the present invention is the multilayer electronic component, wherein said internal grounded electrodes are connected to said plurality of grounded electrodes via holes.

Please replace the paragraph beginning at page 5, line 19 with the following:

A still additional aspect of the present invention is the multilayer electronic component, wherein all or part of said plurality of inductor electrodes are placed on said dielectric sheets that are the same.

Please replace the paragraph beginning at page 5, line 23 with the following:

A yet additional aspect of the present invention is the multilayer electronic component, wherein a direction in which said slots draw is orthogonal to the direction in which said inductor electrodes draw.

Please replace the paragraph beginning at page 6, line 3 with the following:

A still yet additional aspect of the present invention is the multilayer electronic component, wherein said inductor electrodes have a spiral shape.

Please replace the paragraph beginning at page 6, line 6 with the following:

A supplementary aspect of the present invention is the multilayer electronic component, wherein said inductor electrodes have a meander shape.

Please replace the paragraph beginning at page 6, line 9 with the following:

A still supplementary aspect of the present invention is the multilayer electronic component, wherein an inductor comprised of all or part of said inductor electrodes placed not to be sandwiched by said plurality of grounded electrodes is used as a choke coil.

Please replace the paragraph beginning at page 6, line 14 with the following:

A yet supplementary aspect of the present invention is the multilayer electronic component,

Please replace the paragraph beginning at page 6, line 21 with the following:

A still yet supplementary aspect of the present invention is the multilayer electronic component,

Please replace the paragraph beginning at page 7, line 4 with the following:

Another aspect of the present invention is the multilayer electronic component,

Please replace the paragraph beginning at page 7, line 10 with the following:

Still yet another aspect of the present invention is the multilayer electronic component, wherein first inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in a band pass filter, and the inductor comprised of the inductor electrodes other than said part thereof is used in a band pass filter of a frequency band higher than the band pass filter using the inductor formed by said first inductor electrodes.

Please replace the paragraph beginning at page 7, line 19 with the following:

Yet still another aspect of the present invention is the multilayer electronic component, wherein an inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in a GSM circuit, and the inductor comprised of the inductor electrodes other than said part thereof is used in a DCS circuit.

Please replace the paragraph beginning at page 8, line 1 with the following:

Still yet another aspect of the present invention is the multilayer electronic component, wherein an inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in an AMPS circuit, and the inductor comprised of the inductor electrodes other than said part thereof is used in a CDMA2000 circuit.

Please replace the paragraph beginning at page 8, line 8 with the following:

A further aspect of the present invention is the multilayer electronic component, wherein an inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in a PDC circuit, and the inductor comprised of the inductor electrodes other than said part thereof is used in a W-CDMA circuit.

Please replace the paragraph beginning at page 8, line 15 with the following:

A still further aspect of the present invention is the multilayer electronic component,

Please replace the paragraph beginning at page 8 line 21 with the following:

A yet further aspect of the present invention is the multilayer electronic component,

Please replace the paragraph beginning at page 9, line 6 with the following:

A still yet further aspect of the present invention is a communication apparatus having:

reception means of receiving a signal from an antenna, having at least a low noise amplifier, a filter and a mixer;

transmission means of transmitting the signal from said antenna, having at least a mixer, a filter and a power amplifier;

an antenna switch for switching a connection between said antenna and said reception means or said transmission means, whereas:

the multilayer electronic component is used in all or part of the filter of said transmission means, the filter of said reception means, and said antenna switch.

IN THE CLAIMS:

25. (As amended) A communication apparatus having:

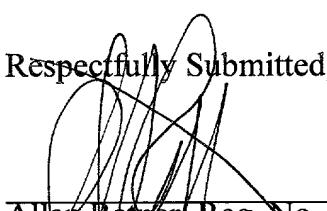
reception means of receiving a signal from an antenna, having at least a low noise amplifier, a filter and a mixer;

transmission means of transmitting the signal from said antenna, having at least a mixer, a filter and a power amplifier;

an antenna switch for switching a connection between said antenna and said reception means or said transmission means, whereas:

the multilayer electronic component according to any one of claims 1-5, 9-11, or 15-24 is used in all or part of the filter of said transmission means, the filter of said reception means, and said antenna switch.

Respectfully Submitted,


Allan Rother, Reg. No. 19,717
Attorney for Applicants

AR/jam

Enclosure: Version with markings to show changes made

Dated: January 11, 2002

Suite 301
One Westlakes, Berwyn
P.O. Box 980
Valley Forge, PA 19482-0980
(610) 407-0700

The Assistant Commissioner for Patents is hereby authorized to charge payment to Deposit Account No. 18-0350 of any fees associated with this communication.

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I hereby certify that this paper and fee are being deposited, under 37 C.F.R. § 1.10 and with sufficient postage, using the "Express Mail Post Office to Addressee" service of the United States Postal Service on the date indicated above and that the deposit is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.


Kathleen Libby

VERSION WITH MARKINGS TO SHOW CHANGES MADEIN THE TITLE:~~MULTILAYER ELECTRONIC COMPONENT AND COMMUNICATION APPARATUS~~MULTILAYER ELECTRONIC COMPONENT AND COMMUNICATION APPARATUS AND METHODIN THE SPECIFICATION:

Specification at page 1, line 5:

The present invention relates to a multilayer electronic component used in a mobile communication apparatus such as a portable telephone ~~and so on~~.

Specification at page 2, line 19:

An object of the present invention is, considering the above problem, to obtain the multilayer electronic component, and its method of manufacture capable of providing an inductor having a high impedance in the multilayered product without using an exterior inductor and providing a plurality of inductors that are close and have little influence over one another.

Specification at page 3, line 1:

One aspect of the present invention is a multilayer electronic component having a multilayered product laminating a plurality of dielectric sheets as one piece,

a plurality of grounded electrodes provided among said dielectric sheets being different inside said multilayered product, and

inductor electrodes provided on said dielectric sheet surfaces not having said plurality of grounded electrodes inside said multilayered product,

wherein all or part of said inductor electrodes are placed in position so as not to be sandwiched by said plurality of grounded electrodes.

Specification at page 3, line 13:

The 2nd invention Another aspect of the present invention is the multilayer electronic component according to 1st invention, wherein the part of said inductor electrodes not sandwiched by said plurality of grounded electrodes is one portion of one inductor electrode.

Specification at page 3, line 18:

The 3rd invention Still another aspect of the present invention is the multilayer electronic component according to 1st invention, wherein the part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are one piece or a plurality of pieces of a plurality of the inductor electrodes.

Specification at page 3, line 23:

The 4th invention Yet still another aspect of the present invention is the multilayer electronic component according to 1st invention, wherein all or part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are placed on the dielectric sheets not sandwiched by said plurality of grounded electrodes.

Specification at page 4, line 4:

The 5th invention Still yet another aspect of the present invention is the multilayer electronic component according to 1st invention, wherein all or part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are placed on the dielectric sheets sandwiched by said plurality of grounded electrodes.

Specification at page 4, line 10:

The 6th invention A further aspect of the present invention is the multilayer electronic component ~~according to 1st or 2nd inventions~~, wherein part of said inductor electrodes not sandwiched by said plurality of grounded electrodes are formed by having slots formed on said grounded electrodes overlap said inductor electrodes.

Specification at page 4, line 16:

The 7th invention A still further aspect of the present invention is the multilayer electronic component ~~according to 1st or 3rd inventions~~, wherein all of said inductor electrodes not sandwiched by said plurality of grounded electrodes are formed by having slots having substantially the same shape as said inductor electrodes formed on said grounded electrodes overlap said inductor electrodes.

Specification at page 4, line 23:

The 8th invention A yet further aspect of the present invention is the multilayer electronic component ~~according to 2nd or 3rd inventions~~, wherein part and other remaining portions of said inductor electrodes not sandwiched by said plurality of grounded electrodes are placed on said dielectric sheets that are the same.

Specification at page 5, line 4:

The 9th invention A still yet further aspect of the present invention is a multilayer electronic component having a multilayered product laminating a plurality of dielectric sheets as one piece,

Specification at page 5, line 15:

The 10th invention An additional aspect of the present invention is the multilayer electronic component ~~according to 9th invention~~, wherein said internal grounded electrodes are connected to said plurality of grounded electrodes via holes.

Specification at page 5, line 19:

The 11th invention A still additional aspect of the present invention is the multilayer electronic component according to 9th invention, wherein all or part of said plurality of inductor electrodes are placed on said dielectric sheets that are the same.

Specification at page 5, line 23:

The 12th invention A yet additional aspect of the present invention is the multilayer electronic component according to 6th invention, wherein a direction in which said slots draw is orthogonal to the direction in which said inductor electrodes draw.

Specification at page 6, line 3:

The 13th invention A still yet additional aspect of the present invention is the multilayer electronic component according to 12th invention, wherein said inductor electrodes have a spiral shape.

Specification at page 6, line 6:

The 14th invention A supplementary aspect of the present invention is the multilayer electronic component according to 12th invention, wherein said inductor electrodes have a meander shape.

Specification at page 6, line 9:

The 15th invention A still supplementary aspect of the present invention is the multilayer electronic component according to 1st invention, wherein an inductor comprised of all or part of said inductor electrodes placed not to be sandwiched by said plurality of grounded electrodes is used as a choke coil.

Specification at page 6, line 14:

The 16th invention A yet supplementary aspect of the present invention is the multilayer electronic component according to 3rd invention,

Specification at page 6, line 21:

~~The 17th invention~~ A still yet supplementary aspect of the present invention is the multilayer electronic component ~~according to 3rd invention~~,

Specification at page 7, line 4:

~~The 18th invention~~ Another aspect of the present invention is the multilayer electronic component ~~according to 3rd invention~~,

Specification at page 7, line 10:

~~The 19th invention~~ Still yet another aspect of the present invention is the multilayer electronic component ~~according to 3rd invention~~, wherein first inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in a band pass filter, and the inductor comprised of the inductor electrodes other than said part thereof is used in a band pass filter of a frequency band higher than the band pass filter using the inductor formed by said first inductor electrodes.

Specification at page 7, line 19:

~~The 20th invention~~ Yet still another aspect of the present invention is the multilayer electronic component ~~according to 3rd invention~~, wherein an inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in a GSM circuit, and the inductor comprised of the inductor electrodes other than said part thereof is used in a DCS circuit.

Specification at page 8, line 1:

~~The 21st invention~~ Still yet another aspect of the present invention is the multilayer electronic component ~~according to 3rd invention~~, wherein an inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in an AMPS circuit, and the inductor

comprised of the inductor electrodes other than said part thereof is used in a CDMA2000 circuit.

Specification at page 8, line 8:

The 22nd inventionA further aspect of the present invention is the multilayer electronic component according to 3rd invention, wherein an inductor comprised of part of said inductor electrodes not to be sandwiched by said plurality of grounded electrodes is used in a PDC circuit, and the inductor comprised of the inductor electrodes other than said part thereof is used in a W-CDMA circuit.

Specification at page 8, line 15:

The 23rd inventionA still further aspect of the present invention is the multilayer electronic component according to 3rd invention,

Specification at page 8 line 21

The 24th inventionA yet further aspect of the present invention is the multilayer electronic component according to 3rd invention,

Specification at page 9, line 6:

The 25th inventionA still yet further aspect of the present invention is a communication apparatus having:

reception means of receiving a signal from an antenna, having at least a low noise amplifier, a filter and a mixer;

transmission means of transmitting the signal from said antenna, having at least a mixer, a filter and a power amplifier;

an antenna switch for switching a connection between said antenna and said reception means or said transmission means, whereas:

the multilayer electronic component according to any of 1st to 24th inventions is used in all or part of the filter of said transmission means, the filter of said reception means, and said antenna switch.

IN THE CLAIMS:

1 25. (As amended) A communication apparatus having:

2 reception means of receiving a signal from an antenna, having at least a low

3 noise amplifier, a filter and a mixer;

4 transmission means of transmitting the signal from said antenna, having at

5 least a mixer, a filter and a power amplifier;

6 an antenna switch for switching a connection between said antenna and said

7 reception means or said transmission means, whereas:-

8 the multilayer electronic component according to any one of claims 1 to 24

9 -5, 9-11, or 9-24 is used in all or part of the filter of said transmission means, the

10 filter of said reception means, and said antenna switch.

the multilayer electronic component according to any of 1st to 24th inventions is used in all or part of the filter of said transmission means, the filter of said reception means, and said antenna switch.

IN THE CLAIMS:

1 25. (As amended) A communication apparatus having:

2 reception means of receiving a signal from an antenna, having at least a low

3 noise amplifier, a filter and a mixer;

4 transmission means of transmitting the signal from said antenna, having at

5 least a mixer, a filter and a power amplifier;

6 an antenna switch for switching a connection between said antenna and said

7 reception means or said transmission means, whereas:

8 the multilayer electronic component according to any one of claims 1 to 24

9 -5, 9-11, or 15-24 is used in all or part of the filter of said transmission means, the

10 filter of said reception means, and said antenna switch.